AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of the Claims:

Claims 1-10 **(canceled)**

11. **(Previously presented)** A method for detecting the presence of target analytes, the method comprising the steps of:

providing an electrode comprising a self-assembled monolayer and an assay complex covalently attached to the electrode, the assay complex comprising a target analyte, a capture binding ligand and an electron transfer moiety;

applying an input waveform to the electrode, the input waveform eliciting a response of characteristic waveform that is unique to target analyte signals from the electrode indicative of electron transfer between the electron transfer moiety and the electrode;

receiving an output waveform from the electrode, responsive to the input waveform;

analyzing the output waveform for the presence of the characteristic waveform as an indication of the presence of said target analytes wherein the analyzing step comprises peak recognition.

12. **(Previously presented)** The method according to claim 11, wherein the step of analyzing the output waveform includes utilizing chronocoulometry.

13. **(Previously presented)** The method according to claim 11, wherein the step of analyzing the output waveform for presence of the characteristic waveform includes applying the output waveform to a digital lock-in amplifier.

14. **(Withdrawn/ Previously presented)** The method according to claim 11, wherein the step of analyzing the output waveform for presence of the characteristic waveform includes fitting the output waveform to the characteristic waveform.

15. **(Withdrawn/ Previously presented)** The method according claim 14, wherein the step of fitting the output waveform to the characteristic waveform includes calculating an error between the characteristic waveform and the output waveform.

16. **(Withdrawn/ Previously presented)** The method according to claim 11, wherein the step of analyzing the output waveform for presence of the characteristic waveform includes determining a background signal and subtracting the background signal from the output waveform.

17. **(Previously presented)** The method according to claim 11 wherein the electron transfer moiety comprises a transition metal complex.

18. **(Previously presented)** The method according to claim 11 wherein the target analyte comprises a nucleic acid.

19. **(Withdrawn)** The method according to claim 11 wherein the target analyte comprises a protein.

20. **(Previously presented)** The method according to claim 11 wherein the input waveform comprises at least a portion having a frequency of about 100 kHz.

21. **(Previously presented)** The method according to claim 11 wherein the input waveform is a voltage waveform and the output waveform is a current waveform.

22. **(Previously presented)** The method according to claim 11 wherein the characteristic waveform comprises a Gaussian waveform.

23. **(Previously presented)** The method according to claim 11 wherein the characteristic waveform comprises a modified Gaussian waveform.

24. **(Previously presented)** The method according to claim 11 further comprising predicting the characteristic waveform, based at least on the electron transfer moiety.

25. **(Previously presented)** A method for detecting the presence of target analytes, the method comprising:

providing an electrode comprising a self-assembled monolayer and an assay complex covalently attached to the electrode, the assay complex comprising a target analyte, a capture binding ligand and an electron transfer moiety;

applying an input waveform to the electrode;

receiving an output waveform that is unique to target analyte signals from the electrode, responsive to the input waveform;

analyzing the output waveform using chronocoulometry to identify electron transfer between the electron transfer moiety and the electrode as an indication of the presence of said target analytes wherein the analyzing step comprises peak recognition.